ACB Cocoa Bioferment

ACB Cocoa Bioferment: Code 20331

INCI Name: Lactobacillus/Theobroma Cacao (*Cocoa*) Ferment Extract
INCI Status: Applied
Suggested Use Level: 1% —10%
Suggested Applications: Firming, Under Eye, Slimming, Phytoestrogen, After Sun

The Olmecs, an ancient people who populated what is now Mexico from 1300 BC to 300 BC, are believed to be the first to have domesticated Theobroma Cacao or the Cocoa tree. By 500 AD, the Mayans were growing Cocoa in dedicated plantations, with beverages made from the fruit of the plant being available only to the elite. Cocoa beans were used as currency, a practice that continued into the 1900's in parts of the Yucatan.

Cocoa has always held a special attraction, particularly when incarnated as chocolate. Often thought to be addictive, Cocoa's mystique continues to evoke potent images. Historically, Cocoa was considered to have strong medicinal properties and was used to treat inflammation, anemia, fever, gout, and lung disorders.

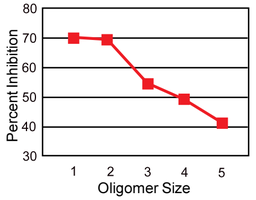
Cocoa contains several classes of materials with strong biological activity. Most notably, Cocoa is rich in xanthine alkaloids, flavonols, and related oligomers. This cocktail of phytochemicals provides some interesting benefits that can be harnessed by cosmetic scientists to solve specific problems. Research shows that Cocoa can reduce platelet aggregation, inhibit lipid peroxidation, inhibit excess Ornithine Decarboxylase activity, and stimulate cutaneous blood flow.

Typical Composition
(mg/g)

Xanthine Alkaloids	77.4
Flavonols/Procyanidins	510.5
Monomer	116.3
Dimer	79.9
Trimer	67.9
Tetramer	64.7
Pentamer	56.5

Typically, Cocoa is applied to treat conditions like cellulite, focusing on the benefits of the xanthine alkaloids present as well as the ability of flavones to block estrogen receptors. With the enhanced delivery of phytoactives resulting from biofermentation with Lactobacillus, **ACB Cocoa Bioferment** is also ideal for the treatment of under eye circles.

Leukotriene A4 Inhibition

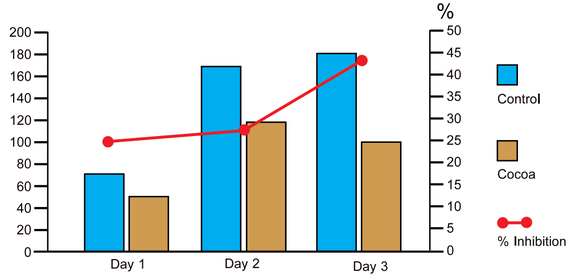


The arachidonic acid cascade mediates inflammation, in many cases, through the action of leukotrienes. A study was performed to evaluate the ability of Cocoa flavonoids that inhibit leukotriene formation. In this study human recombinant 5-lipoxygenase was used to convert arachidonic acid to 5-hydroperoxy-6E,8Z,11KZ,14Z-eicosatetraenoic acid *(5-HpETE),* a precursor to 5,6 leukotriene A4 *(LTA4)* formation. LTA4 is a critical intermediate to the synthesis of other leukotrienes and as such a suitable marker. As LTA4 is an unstable epoxide, its presence is measured indirectly by evaluating the concentrations of its hydrolysis products.

This study shows that Cocoa procyanidin oligomers are effective at inhibiting LTA4 synthesis in a major inflammatory pathway. Efficacy is reduced with increased polymerization.

The antioxidant properties of flavonols is undisputed; however, flavonols have an additional mechanism by which they can protect cells. Ornithine Decarboxylase *(ODC)* catalyzes the conversion of the amino acid ornithine to the polyamine putrescine and CO_2. Polyamines regulate cell proliferation. In the face of excessive oxidative stress as induced by UV radiation or pollution, polyamines can produce abnormal cells. Flavonols are capable of preventing induction of ODC beyond normal levels. In this study human colon cancer cells *(Caco-2)* are treated in culture with Cocoa extract *(50µg/ml)*. ODC activity is measured by monitoring CO_2 production. It is most probably for this reason that Cocoa isoflavones have been shown to reduce the number of sunburn cells resulting from exposure to UV radiation. Clearly the benefits of isoflavones are well suited to today's environmental protection claims.

Ornithine Decarboxylase Inhibition



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